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- (54) Title of the Invention: A Cosmetic Material
- (21) Application No.: 60-122134
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### Specification

**Title of the Invention: A Cosmetic Material**

**Claim:**

A cosmetic material characterized in that soybean milk is compounded as a specified component with the cosmetic material components, and, moreover, in that greater than 2 w % surfactant is compounded relative to the solid components in the soybean milk.

## Detailed Description of the Invention

(Field of Industrial Use)

**This invention relates to a cosmetic material in which soybean milk is compounded.**

[NOTE: between line characters are Japanese phonetic spelling of Glycine max Merrill]

Soybeans are the seeds of the plant *Glycine max* Merrill of the family Leguminosae. It is important as a plant protein source and everyone knows that bean curd (*tofu*), which is a processed product of it, is a food product that has a beautifying effect.

The inventors discovered experimentally that soybeans can not only serve as a food product but that they also have various functions of a cosmetic nature when used topically. In making products containing them into commercial products, its extract, which is an aqueous extract, is so-called "soybean milk," which is desired to be in an emulsion state. For this reason, cosmetic materials in which it is used as a raw material are provided and it is widely used in the cosmetics industry and in barber and beauty shops.

(Prior Art)

The object of this invention is "soybean milk," which is an emulsion that is obtained by aqueous extraction of soybean seeds, grinding them after they have swollen, adding water to them and heating them and separating the insoluble residue by filtration. In general, soybean milk is a white to yellow-tinged white emulsion that has a pH of 7.0 to 7.5 and contains approximately 9% solid components. When a salt or acid is added and it is heated, cheese-like *tofu* in which the protein has gelled is separated out. Soybean milk contains 3 to 5% of protein and 3 to 5% of lipid. These proteins have an excellent amino acid balance, being high in lysine, and the fat component has a high linoleic acid content. In addition, it contains large amounts of substances relevant to cosmetics such as saponin, phospholipids and vitamin E. In spite of the fact that it is recommended for the effects it will have as a cosmetic material, there have been no reports [Amendment 1] of its topical use. As somewhat similar examples, shampoos containing red beans [*azuki*] for the purpose of a saponin effect, hair dyes in which black pigments are used and hair cosmetic products containing lecithin that has been subjected to solvent extraction are known. Of legendary interest, we have heard of milk baths and examples of folk practices in which people have washed their faces with *tofu* refuse (bean curd [*tofu*] refuse) to make them white. [NOTE: The term in parentheses is a different word for *tofu* refuse as opposed to the literal term outside the parentheses.]

(Action)

When the inventors used soybean milk as a cosmetic material, they found various unanticipated effects.

I) Usefulness of adding water

It is said that dry skin from which moisture has been lost hastens aging. Soybean milk, because of the components that it contains, has the actions of furnishing water content and of maintaining a suitable degree of water content. Table 1 shows the data on 20 volunteers who used it when water content was determined by a moisture meter.

Table 1

	Control	Wiped with water	Wiped with soybean milk
Forehead			
After 30 minutes	19 ~ 26	22 ~ 29	23 ~ 28
After 2 hours	18 ~ 24	19 ~ 22	20 ~ 25
Upper arms			
After 30 minutes	23 ~ 32	25 ~ 30	26 ~ 32
After 2 hours	21 ~ 30	21 ~ 30	24 ~ 32
Palms and backs of hands			
After 30 minutes	16 ~ 24	18 ~ 26	20 ~ 30
After 2 hours	14 ~ 26	14 ~ 26	16 ~ 29

## II) Effect of providing a lustrous feeling

An experiment was performed for providing a moist lustrous feeling by applying soybean milk to the skin or hair and then bathing or showering, after which it was removed. When a comparison was made at the same time of individuals who had not undergone the application treatment, there was clearly a different feel. This feel has an aspect that cannot be expressed by scientific data but which can be grasped from the questionnaires of the volunteers. Table 2 shows the results when 1.8 liters of soybean milk were added to a 180 liter capacity tub for household use and the subjects bathed in it.

Table 2

Breakdown of test subjects	Age 6-12	Age 13-18	Age 19-26	Age 27-36	Age 36-56	Over age 56	Totals
Males (persons)	3	7	8	9	23	9	59
Females (persons)	5	6	12	14	18	6	61
Totals	8	13	20	23	41	15	120

### Questionnaire Results

	Good	Neither better or worse	Didn't like	No response
About the bath area	Texture of bath was delicate 77	No different from usual 10	Didn't like it 12	Can't make a judgment 21
During bathing	Good for bathing 90	No particular difference 3	Bad feeling 9	No response 18
Washing with soap	Lathered well 86	No particular difference 14	Did not remove dirt 4	Not clear 16
Feeling on getting out of tub	Warm feeling 94	No particular difference 9	Bad feeling 10	Can't decide 7
Feel of skin	Smooth feeling 38	No particular difference 4	Not refreshed 2	
	Moist feeling 35		Feeling of something left on skin 3	Not clear 4
	Full feeling 25		Sticky feeling 9	

Further, when soybean milk was compounded and used during shampooing, there was no glare when a hair tonic was subsequently applied and there was a stable luster.

### III) Use in removing dirt

Oil and fat components, saponin and lecithin were mixed with soybean milk. They are hydrophilic and serve to remove lipoid dirt. When the inventors used them compounded with soap, foaming occurred and dirt was released. When a water wash was observed under the microscope, it was seen that fine particles of soybean milk enveloped the dirt particles. When, considering this action, we use stable soybean milk colloid, which has a pH of 7.0 to 8.0, with hair and skin, which are present together, and are acidic substances with pH of 3.5 to 5.0, we find that the soybean milk particles incorporate them and become large and coarser. When acidic substance are present in large quantities and the balance is broken, it becomes condensed in the tofu-like scum and is dispersed by active agents. Therefore, it is thought that the dirt is removed in the previous stage.

Experiment A: Face powder (facial compound 80.0%, sorbitol 4.0%, sorbitan sesquioleate 10.0%, vaseline 0.5%, liquid paraffin 2.0%, propylene glycol 2.5%, castor oil 1.0%) was applied regularly to frosted glass and a test strip was made. The experiment [sic] was immersed in 10-times diluted solutions of the formulation of Example 1 (A) and of formulation (B) from which the 100.0% of the soybean milk had been removed leaving the remainder. The test materials were agitated for 30 minutes and the test strips were removed and washed with water 5 times. When the ratio of transmittance of light was determined taking the frosted glass before the experiment as the standard, the following results were obtained.

A [Amendment 2]: 97.7%

B [Amendment 2]: 82.1%

### IV) Other effects

As described above, soybean milk contains large amounts of amino acids, fatty acids, lecithin and vitamins, for which reason its effect in maintaining healthy scalp, hair and skin even when applied to the body externally can well be inferred.

### V) Toxicity

Soybean milk does not exhibit any toxicity whatsoever when it is consumed. Eight women used a 10-times dilution of soybean milk to wash their faces every day. No abnormalities whatsoever were found after 92 days.

As described above, soybean milk was found to be effective. However, the first problem in the actual use of cosmetic products that contain it involve putrefaction and degeneration. This problem can be solved by such means as the addition of suitable chemical agents and sterilization treatments.

The second problem is the occurrence of refuse (hard and soft states like that of tofu, referred to hereafter as scum). Specifically, when soybean milk is heated in the presence of an electrolyte, it exhibits the property of coagulation as in previous technologies. Until the point of coagulation is reached, to the extent that the particles simply grow larger and bind, the dirt component is increased and is removed. However, in states in which there is a marked change in the extent of this, for example, when large amounts of acidic substances such as perspiration remain and when hard water and seawater are used, a state of coagulation occurs and scum is formed and remains on the skin or head hair. Even though scum itself does not have a bad effect physiologically on the cosmetic effect, the scum cannot be washed off and the individual cannot go out in public when it is attached. Consequently, means must be taken so that coagulation of this scum does not occur in cosmetic products.

The inventors discovered that surfactants can be added specifically as a method for solving this problem.

Because raw soybean milk has a high water content as described above and also taking into consideration the points of convenience of handling and degeneration, dry product should be used. As an example of analysis of dry soybean milk products, values are ordinarily 40 to 45% for protein, 15 to 18% for lipids, 30 to 35% for carbohydrates, 4 to 5% for ash content and 2 to 10% for water content. [NOTE: Paragraph added in accordance with Amendment 3]

Experiment B: 10 ml of commercial soybean milk [no additives: evaporation residue 9.14% 105° 2 g, 3 hr] was collected in a beaker and 20 ml of water and various quantities of surfactant were added. Next, 10 ml of  $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$  N/10 solution was added to make a total volume of 50 ml. This mixture was heated over a hot bath for 30 minutes. It was then filtered through a filter cloth and the water was drained for 5 minutes, after which the scum remaining on the filter cloth (containing water as is) was weighed. The results are shown in the figure.

In figure, [A] is shown the case in which no surfactant was added and in which more than 10 g of scum was produced and [B] is the case in which  $\text{CaCl}_2$  was not added. In the cases in which a surfactant [W, X, Y and Z] was used, it was possible to inhibit the occurrence of scum to a certain extent. The materials used as indicated by the symbols in the figure were as follows.

W: Nonionic type (polyoxyethylene nonylphenol ether)

X: Cationic type (tetradecylamine acetate) [NOTE: legibility in question here]

Y: Bifunctional type (dimethyl alkyl betaine)

Z: Anionic type (potassium stearate soap)

The nonionic type was found to be the most effective. An effect was found with greater than 0.2 w% relative to the soybean milk, i.e., an amount corresponding to 2 wt % of the solid matter of the soybean milk.

However, when there was also a large amount of  $\text{CaCl}_2$ , scum precipitated, it was necessary to increase the quantity of surfactant. The combined use of a complexing agent was also effective.

In analyzing cosmetic products of this invention that contain a surfactant and soybean milk, the surfactant is analyzed by a standard method. It is added in an amount greater than the equivalent amount of soybean milk, which is thought to contain  $\text{BaCl}_2$ , and is boiled. The difference between the dried weight of the precipitate and its incinerated weight is measured. At the same time, the same procedure is carried out for the soy milk and a comparison is made. By this means, a quantitative determination can be made. Greater precision can be obtained by analyzing the N component.

#### Example 1

##### Shampoo Formulation

a. Soybean milk (containing 8.74% of solid matter)	10.0 W%
b. Polyoxyethylene lauryl ether sodium sulfate	30.0
c. Polyoxyethylene polyoxypropylene lanolin	2.0
d. Ethylene glycol distearate	1.5
e. Glycerol	4.0
f. Paraben (methyl, ethyl)	0.3

g. Diethanolamide laurate	5.0
h. Benzalkonium hydrochloride	0.1
i. EDTA sodium salt	0.1
j. Carboxymethyl cellulose	1.0
k. Perfumes and pigments	g.s.
l. Purified water	45.9

j was added in advance to 20 times its volume of purified water and was stirred and dissolved as it was being heated. Next, b through e were added. Separately, a solution in which a, g, i and the remaining purified water were mixed was added, it was heated in the vicinity of  $70^{\circ}\text{C}$  and it was filtered with bleached cotton cloth, f, h and k were mixed and a product was obtained. This product was a shampoo for head hair having pail yellow bar-shaped microparticle luster. Hair oil was completely washed off without loss of hair quality. When the hair was dry blown after washing, there was a moist feel. There was no occurrence whatsoever of hardened scum, and, consequently, strips of dirt were not attached after hair washing.

## Example 2

### Example of a Cold Cream

a. Soybean milk (containing 9.07% of solid matter)	5.0 W%
b. Paraffin	5.0
c. Lanolin	3.0
d. Isopropyl myristate	6.0
e. Squalane	3.0
f. Mineral oil	25.0
g. Castor oil	5.0
h. Polyoxyethylene sorbitan monostearate	2.0
i. Sorbitan monostearate	5.0
j. Paraben	0.2
k. Salicylic acid anilide	0.3
l. Boric acid	0.3
m. Fragrances	0.2
n. Purified water	40.0

b through h were mixed to form A. a, i through l and m were mixed to form B. They were both heated to  $50^{\circ}\text{C}$  and A was introduced into B. Next, m was added and thoroughly mixed and kneaded to form

a cream. When this product was applied to the skin, there was a refreshing feeling. The texture of the cream was fine and had a good feel and it did not separate. On observation under the microscope, each particle was found to be arranged uniformly and scum did not develop during storage.

### Example 3

#### Example of Lotion (for dry skin)

a. Soybean milk (9.07% solid content)	3.5 W%
b. Stearic acid	2.0
c. Liquid paraffin	0.5
d. Sorbitol (70%)	2.0
e. Glycerol	2.0
f. Polyoxyethylene sorbitol monolaurate	1.5
g. Triethanolamine	0.2
h. Zinc phenol sulfonate	0.5
i. Hexachlorophene	0.2
j. EDTA sodium salt	0.5
k. Perfumes	Suitable amount
l. Purified water	added to make 100

a through l were mixed and a vial was filled with the mixture and stoppered to make a product. This product was a vanishing hand lotion containing soybean milk. The skin of housewives and housewives handling industrial water that had lost its water-soluble water components (Amendment 4) contained in the stratum corneum of the skin easily becomes rough. This product has the objective of replenishing this water by means of the components contained in soybean milk. Because this effect is lost when the emulsified particles of soybean milk becomes coarse scum, measures are taken to maintain its dispersion in fine particles by compounding f and other substances.

### Example 4

#### Example of Hair Lotion (Rinse)

##### Formulation

a. Soybean milk powder [Amendment 5] (solid content 92 wt %)	5.0 W%
b. Polyoxyethylene nonyl phenol	1.0
c. Lecithin	0.2
d. Castor oil	2.0

e. Olive oil	2.0
f. Sodium alginate	0.1
g. Alcohol (90%)	40.0
h. Cayenne pepper sticks	1.0
i. T oil [NOTE: possible abbreviation for Tall oil]	0.2
j. Paraben	0.2
k. Purified water	48.3

First, f was heated to 50° and thoroughly dissolved in g and k in that order and a, b, c, j, h, i, d and e were compounded in that order. In general, when this type of alcoholic aqueous solution is used as the base, compounding of large quantities of c, d and e brings about separation. However, by compounding a and b, a stable, emulsified state is brought about. This product prevents dryness of head hair, gives it pliability and inhibits occurrence of dandruff and itching.

In addition, it is particularly effective in protecting hair that has been subjected to permanent wave and hair dyeing treatment. Specifically, although these treatment agents are present in minute amounts after hair washing and damage hair quality, by making this product as a lotion, the hair is preserved by its action with the soybean oil.

#### Example 5

##### Example of Bath Agent

a. Soybean milk (solid content, 14.7%)	60.0 W%
b. Na lauryl sulfate	5.0
c. Polyoxyethylene nonyl phenol	5.0
d. Hexamine	0.5
e. EDTA tetrasodium salt	0.5
f. Gentian violet (can be replaced by other pigments)	0.2
g. Perfumes	0.5
h. Purified water	28.83

A through h were mixed and bonded to make the product. 180 ml of this product was used one time in a 180 liter family bath tub. When a large quantity was used, marked foaming occurs, it can be used in foreign style or special baths and incrustation in hot baths does not occur.

#### (Effect)

This invention can be used over a broad range as a cosmetic material, specifically as hair washing and head hair cosmetic products such as shampoos and rinses, general toilet waters such as after shave lotion and hand lotion, cream emulsions such as cleansing cream, shaving cream and cold cream, pack cosmetic



materials, foundations, bathing cosmetic products, face washing materials and soaps. After their use, they have the effect of making the skin and hair clean and moist and maintaining their health.

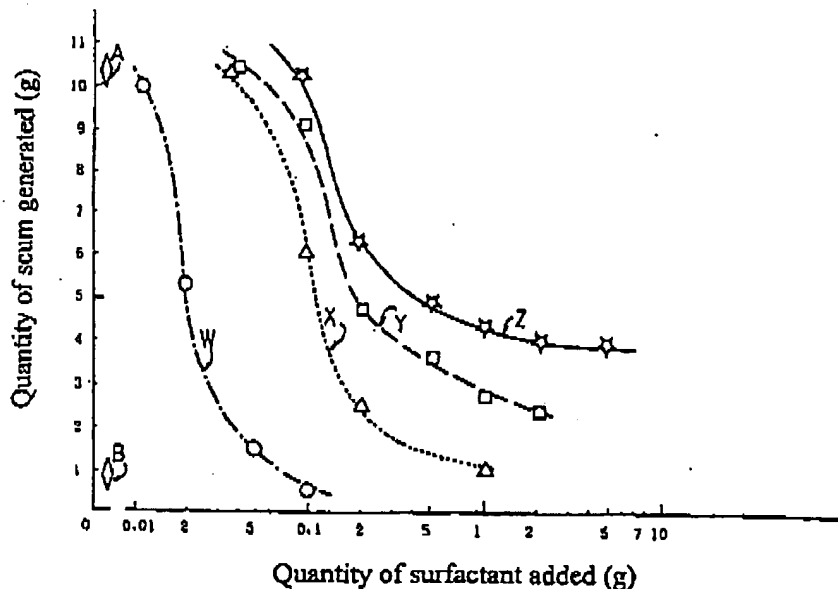
#### Brief Explanation of the Figure

The figure is a graphing of the experimental results indicating that addition of a surfactant is effective for controlling formation of scum on soybean milk. The horizontal axis shows the quantity of surfactant added and the vertical axis shows the quantity of scum generated.

The experimental conditions are described in the detailed description.

- A: Case in which surfactant was not added but in which  $\text{CaCl}_2$  was added
- B: Case in which surfactant was not added and in which  $\text{CaCl}_2$  was not added
- W: Case in which a nonionic surfactant was added
- X: Case in which a cationic surfactant was added
- Y: Case in which an amphoteric surfactant was added
- Z: Case in which an anionic surfactant was added

Applicant: Kashiwa Chemical Company, Ltd.



[NOTE: The Specification is followed by several Amendments.]

[Upper right quadrant and lower left quadrant, page (6): Amendment to the Document (Voluntary), dated 16 July 1986. This amendment affects a portion of the Specification and the contents are as follows. These changes have been made in the translation and the locations indicated as "Amendment 1," "Amendment 2," etc.

- (1) This amendment provides for correction of a printing error.
- (2) This amendment presents a translation problem. It provides for replacement of the English letters A and B by the Japanese characters that are used in lists. In the translation, English "A" and "B" have been retained.
- (3) This amendment provides for the insertion of the paragraph noted as Amendment 3 in the translation.
- (4) This amendment provides for the correction of a printing error.
- (5) This amendment provides for the addition of the word "powder" after soybean milk in the list of ingredients in Example 4.
- (6) Lower right quadrant, page (6): Amendment dated 5 September 1986. This amendment provides for a correction of the amendment of 16 July 1986 and is supplied separately.
- (7) Upper left quadrant, page (7): Amendment dated 16 July 1986. This amendment refers to the "Detailed Description of the Invention" under the Specification and is supplied separately.

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**EXHIBIT B**